

## General Description

This MOSFET uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as -4.5V. This device is suitable for use as a wide variety of applications.

## Features

- Low gate charge
- 100% UIS tested, 100% DVDS tested
- High power and current handling capability
- Lead free product is acquired

## Applications

- DC/DC Converter
- Power management switches



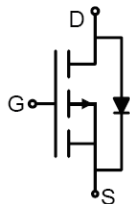
## Key Performance Parameters

Parameter	Value	Unit
$V_{DS}$	-100	V
$R_{DS(ON), max} @ V_{GS} = -10V$	50	m $\Omega$

## Marking Information

Product Name	Package	Marking
OSH10P50DF	TO-252	OSH10P50D

## Package & Pin information



**Absolute Maximum Ratings** at  $T_j=25^{\circ}\text{C}$  unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	-100	V
Gate-source voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	-30	A
Pulsed Drain Current <sup>1)</sup>	$I_{D,pulse}$	-116	A
Power Dissipation	$P_D$	86	W
Single pulsed avalanche energy <sup>2)</sup>	$E_{AS}$	361	mJ
Operation and storage temperature	$T_{stg}, T_j$	-55 to 150	$^{\circ}\text{C}$

**Thermal Characteristics**

Parameter	Symbol	Value	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	1.45	$^{\circ}\text{C/W}$

**Electrical Characteristics** at  $T_j=25^{\circ}\text{C}$  unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	$BV_{DSS}$	-100			V	$V_{GS}=0\text{ V}, I_D=-250\ \mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	-1.0	-1.8	-2.5	V	$V_{DS}=V_{GS}, I_D=-250\ \mu\text{A}$
Drain-source on-state resistance	$R_{DS(ON)}$		40	50	$\text{m}\Omega$	$V_{GS}=-10\text{ V}, I_D=-15\text{ A}$
Drain-source on-state resistance	$R_{DS(ON)}$		42	56	$\text{m}\Omega$	$V_{GS}=-4.5\text{ V}, I_D=-10\text{ A}$
Gate-source leakage current	$I_{GSS}$			100	nA	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$
				-100		$V_{GS}=-20\text{ V}, V_{DS}=0\text{ V}$
Drain-source leakage current	$I_{DSS}$			-1	$\mu\text{A}$	$V_{DS}=-100\text{ V}, V_{GS}=0\text{ V}$

### Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	$C_{iss}$		8056		pF	$V_{GS}=0\text{ V}$ , $V_{DS}=-10\text{ V}$ , $f=1.0\text{ MHz}$
Output capacitance	$C_{oss}$		195		pF	
Reverse transfer capacitance	$C_{rss}$		70		pF	
Turn-on Delay Time	$t_{d(on)}$		13		ns	$V_{GS}=-10\text{ V}$ , $V_{DS}=-50\text{ V}$ , $R_L=3\ \Omega$ , $R_{GEN}=3\ \Omega$
Turn-on Rise Time	$t_r$		64		ns	
Turn-Off Delay Time	$t_{d(off)}$		36		ns	
Turn-Off Fall Time	$t_f$		52		ns	

### Gate Charge Characteristics

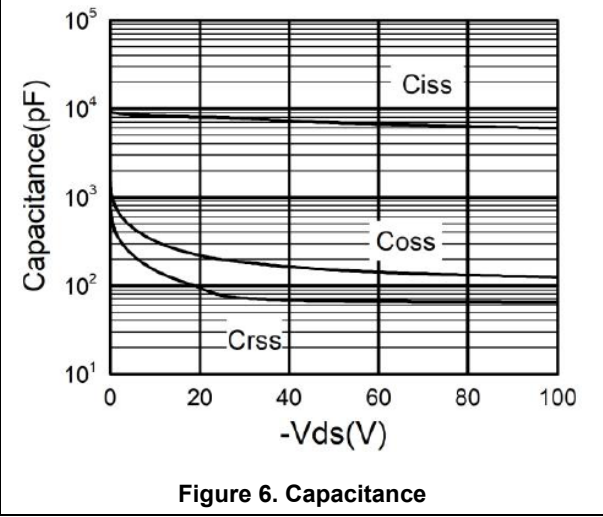
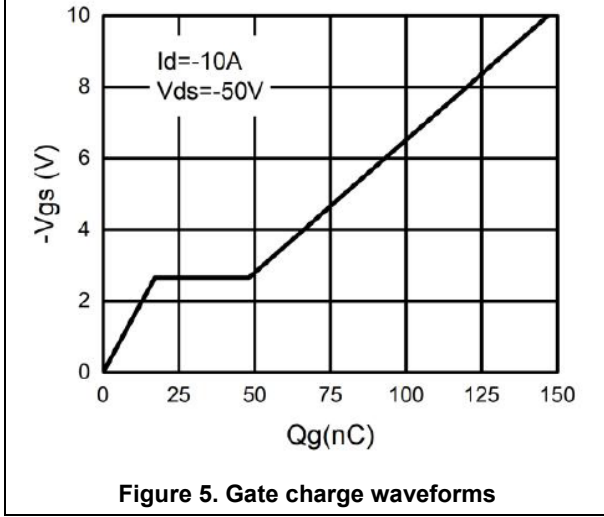
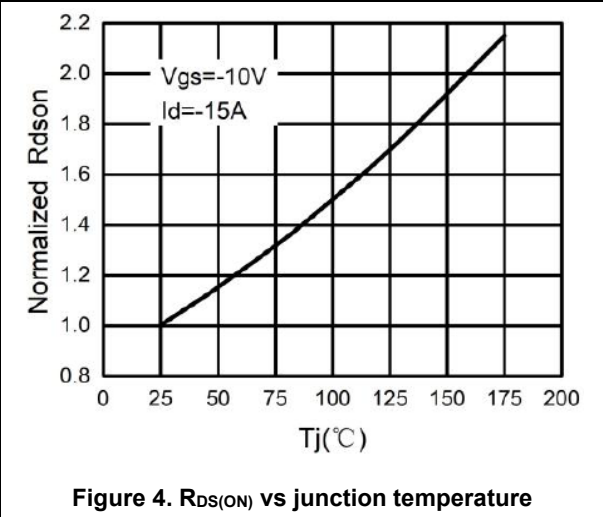
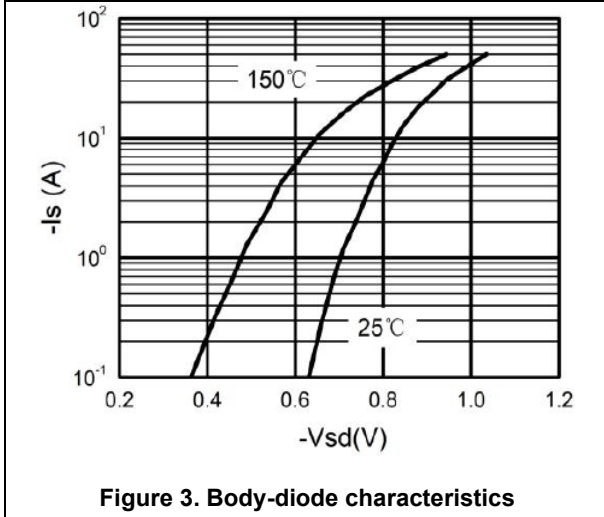
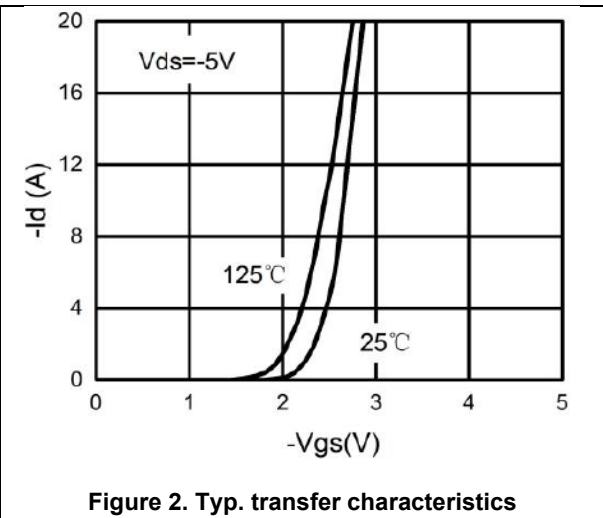
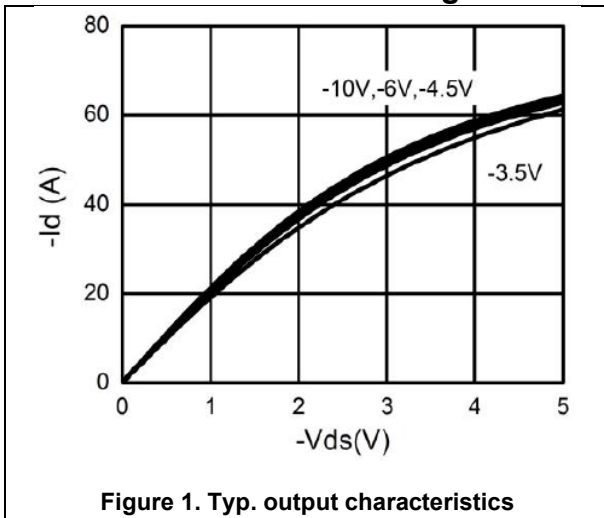
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total Gate Charge	$Q_g$		147		nC	$V_{GS}=-10\text{ V}$ , $V_{DS}=-50\text{ V}$ , $I_D=-15\text{ A}$
Gate-Source Charge	$Q_{gs}$		17		nC	
Gate-Drain Charge	$Q_{gd}$		31		nC	

### Body Diode Characteristics

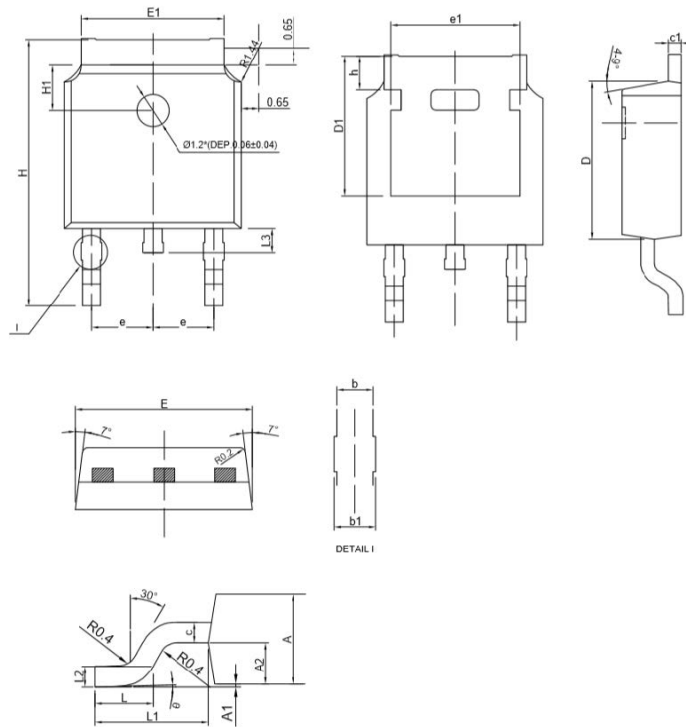
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Source drain current (Body Diode)	$I_{SD}$			-30	A	$T_A=25^\circ\text{C}$
Diode forward voltage <sup>3)</sup>	$V_{SD}$			-1.2	V	$I_S=-15\text{ A}$ , $V_{GS}=0\text{ V}$
Reverse Recovery Time	$t_{rr}$		70		ns	$I_F=-15\text{ A}$ , $di/dt=100\text{ A/us}$
Reverse Recovery Charge	$Q_{rr}$		120		nC	

- Note:**
- 1) Pulse width limited by maximum allowable junction temperature.
  - 2) EAS condition:  $T_J=25^\circ\text{C}$ ,  $V_{DD}=-50\text{V}$ ,  $V_G=-10\text{V}$ ,  $R_g=25\ \Omega$ ,  $L=0.5\text{mH}$ .
  - 3) Repetitive Rating: Pulse width limited by maximum junction temperature.

**Electrical Characteristics Diagrams**



**Package Information**



Symbol	mm		
	Min.	Typ.	Max.
A	2.200	2.300	2.400
A1	0.000	0.075	0.15
A2	0.97	1.02	1.07
b	0.60	0.67	0.74
b1	0.65	-	1.15
c	0.508	0.528	0.548
c1	0.478	0.508	0.538
D	6.0	6.1	6.2
D1	5.15	5.25	5.35
E	6.5	6.6	6.7
E1	5.184	5.334	5.484
e	2.286BSC		
e1	4.806	4.826	4.846
H	9.8	10.0	10.2
H1	1.5	1.6	1.7
h	1.15	1.25	1.35
L	1.4	1.5	1.6
L1	2.888REF		
L2	0.51BSC		
L3	0.8	0.9	1.0
θ	0°	-	10°

Version1: TO-252-G package outline dimension

**Ordering Information**

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO-252-G	2500	1	2500	6	15000

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